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FINAL REPORT
AD HOC SUBGROUP
ON
THREAT OF AIDS ON OPERATIONAL DEPLOYMENT
OF ARMY FORCES TO A THEATER
JULY 1990

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Ad Hoc Subgroup on Threat of AIDS
on Operational Deployment of Army Forces to a Theater
Army Science Board

EXECUTIVE SUMMARY

The Human Immunodeficiency Virus (HIV) pandemic, of which Acquired Immune Deficiency Syndrome (AIDS) represents the fatal end stage, continues to expand in its threat to human populations throughout the world. Although accurate data on prevalence of HIV infection are not available anywhere in the world, serious epidemics are known to be occurring in much of Sub-Saharan Africa, parts of the Caribbean, Latin America, Europe, Southeast Asia, and in major urban centers in the United States.

The global nature of the pandemic constitutes a challenge to the operational Army that has not yet been fully addressed. The Army Science Board was therefore requested by the Assistant Secretary of the Army for Research, Development and Acquisition, to review several Terms of Reference (TOR related to HIV infection and AIDS). Subsequently, the Subgroup met to consider this threat on six occasions between July 1988 and April 1990.

The Subgroup determined that a report following the outline implied by the TORs would be overly constraining due to the complexity and interrelationship of the issues raised by HIV and AIDS. Instead, the Subgroup's report is organized under three major headings: Combat Readiness; Medical Care and Disease Intervention; and Research. These topics encompass the significant choices and challenges presented to the Army by the HIV pandemic.

The following paragraphs summarize the major findings and recommendations of the Subgroup. Each entry references the complete finding or recommendation and its location in the body of the report. The basis of each finding and the recommendation is found in the accompanying discussion.

COMBAT READINESS

I. FINDINGS

A. GLOBAL THREAT

Medical Intelligence. Accurate information does not exist on the epidemiology of HIV infection in many countries and regions. Communication between the medical research and the intelligence communities is inadequate. While information

on AIDS is often politically and militarily sensitive, accurate, reliable information on the incidence and prevalence of HIV infection would be invaluable in the formulation and implementation of military programs and activities. (F-2, F-3, page 3)

B. MANPOWER

Manpower. Assuming that the current policy of non-accession of HIV-infected applicants continues, that recruitment quotas are not increased, and that the prevalence of HIV infection over the next several years remains below 2/1000 among eligible personnel, it is unlikely that recruitment will be significantly compromised by HIV infection in the general population of the U.S. (F-4, page 6)

C. DEPLOYABILITY

Deployability of HIV-Infected Soldiers. Army policies contained in AR 600-110 reflect DOD policy by precluding any temporary or permanent assignment of HIV-infected soldiers outside the continental United States (OCONUS), and prohibiting their assignment in CONUS to Special Operations Command units and COHORT units scheduled for overseas rotation. Army policy also precludes assignment of HIV-infected soldiers to advanced civilian schooling, fellowships, or equivalent training programs which are not required for career progression, and prohibits them from military training resulting in a change to their Military Occupational Specialty (MOS). Taken together, these requirements are unrealistic and inconsistent, endanger confidentiality, and cause considerable difficulty for commanders. (F-7, page 10)

D. BLOOD SUPPLY

Blood Supply During Deployments. Blood supply issues have not been fully addressed relative to areas of the world with a high prevalence and incidence of HIV infection. While military operations have well-defined blood requirements coordinated through the Armed Services Blood Program Office (ASBPO), it is not clear if all these requirements can be met. Small unit deployments constitute special blood replacement problems due to the host nation capabilities and/or policies or limited U.S. military logistical support implied. (F-10, page 16)

II. RECOMMENDATIONS

A. GLOBAL THREAT

1. International Preventive Efforts. The Army should continue in its efforts to encourage nations to pursue testing of all donor blood supplies for HIV antibody, and to

develop preventive health education programs on AIDS. Screening of cooperative foreign military forces for HIV infection should be encouraged to identify the extent of infection within their ranks. (R-1, page 4)

2. Joint Operations with Foreign Military. The DoD, in coordination with other federal agencies, departments, and services, should develop policies for joint operations and activities with foreign military forces that may not have been screened for HIV infection. The feasibility of U.S.-financed and -assisted HIV testing programs should be explored. (R-3, page 5)

3. Global HIV Information. As the lead agency for medical research on HIV infection within the Department of Defense, the Army should coordinate DOD-wide collection and analyses of medical research data related to HIV prevalence in geographical areas of potential peacetime or wartime national interest. These data should be provided on a regular basis to appropriate government agencies. (R-4, page 5)

B. MANPOWER

1. Evaluation of Issues. The Army should fully evaluate the medical, physiological, psychological, performance, operational, and command issues which accompany the retention of HIV-infected soldiers in active and reserve units. This should be accomplished through well-designed and unbiased studies and evaluation. (R-8, page 8)

2. Retention. It is the opinion of the majority of the Subgroup that at this time, the Army should not seek a change in the current DoD policy on retention of HIV-infected soldiers with early infection. (R-9, page 9)

C. DEPLOYABILITY

Deployability Policies. The Army should establish unambiguous policies that resolve the conflicts between current personnel policies related to deployment, unit integration, and confidentiality. A majority of the subgroup favors reassignment of HIV-infected soldiers from deployable units to non-deployable units. (R-12, page 14)

D. BLOOD SUPPLY

Blood Supply. The Army, supported by the Armed Services Blood Program Office (ASBPO), should develop a clearly defined transfusion policy, including guidelines on the use or nonuse of donated blood obtained from specific foreign sources. (R-17, page 17)

MEDICAL CARE AND DISEASE INTERVENTION

I. FINDINGS

A. MEDICAL TREATMENT

Treatment of HIV-Infected Individuals. Current Army efforts to identify, evaluate, treat, and follow HIV-infected individuals are equal to or better than similar efforts in the civilian sector. The cost of providing health care to this population will continue to escalate in the foreseeable future, as new modes of therapy evolve. This increased cost must be borne by DOD, and will be felt by the Army Medical Department, since HIV-infected beneficiaries will gravitate toward the more comprehensive care generally provided in military treatment facilities. (F-12, F-13, page 18)

B. PREVENTION

Health Education and Primary Prevention. The Army has a limited HIV awareness program directed at the prevention of HIV infection in the Army community. Although the Army recognizes the value of education in prevention, little progress is evident, as nearly 500 active duty cases per year are projected to occur. (F-15, page 21)

II. RECOMMENDATIONS

A. MEDICAL TREATMENT

1. Psychosocial Support and Counseling. The Army should increasingly emphasize the provision of psychosocial support and counseling to help HIV-infected soldiers cope with the diagnoses and progression of their disease. (R-22, page 20)

2. Medical Program Resources. The Army must continuously program the increasing financial and personnel resources required to care for HIV-infected soldiers, family members, and other beneficiaries. (R-23, page 20)

B. PREVENTION

Behavioral Change. Efforts to effect widescale changes in at-risk behavior must be directed at all levels of the Army structure, from senior leaders to troops. Influencing behavioral change requires a moral as well as a policy commitment from the senior Army leadership to keep soldiers from contracting this deadly illness. (R-29, page 23)

RESEARCH

I. FINDINGS

A. READINESS ISSUES

Readiness and Research. To date, little medical research has been specifically directed at issues of readiness. No medical data exist that unequivocally place soldiers with early HIV infection (Walter Reed stages 1 and 2) at increased medical risk during deployment to OCONUS areas. The Army's medical research effort lacks sufficient emphasis on HIV prophylaxis, vaccine testing, and drug treatment. (F-17, F-18, page 24)

B. TREATMENT AND PREVENTION

Research Program. The comprehensive Army research effort on HIV disease especially its vaccine development and testing program, uniquely complements other international governmental, academic and industrial programs. (F-23, page 29)

II. RECOMMENDATIONS

A. READINESS ISSUES

1. Deployment Transmission Risks. The Army should undertake both epidemiological and clinical research to determine any increased risks faced by HIV-infected as well as uninfected individuals as a consequence of combat deployment. Risks associated with traumatic battlefield injuries, as well as preventive measures should be identified. (R-32, page 27)

2. Safety of the Blood Supply. The Army should give high priority to the development and/or testing of a promising rapid screening test for HIV and should continue its efforts to provide safe blood and blood components in the field setting. (R-38, page 28)

B. RESEARCH RESOURCES

Funding and Resources. The research program must be adequately funded and staffed in order to be successful. Since the Army is the Lead Agency within DOD for this research, research resources allocated to the Army must also support Navy, Marine, and Air Force research programs. Resource demands are also greater because the disease treatment process includes a large psychosocial support component. Resource requirement estimates developed for the Subgroup indicate that the funding must be increased from the current level of \$22 million per year. Assured funding of at least \$45 million in

constant 1991 dollars must be maintained until the minimum goals are met. These estimates must be periodically readjusted based on new research findings and future medical cost increases. Dual year funding should not be used. (R-44, page 31)

Ad Hoc Subgroup on Threat of AIDS
on Operational Deployment of Army Forces to a Theater
Army Science Board

INTRODUCTION

The Army Science Board was requested by the Assistant Secretary of the Army for Research, Development and Acquisition, to review several Terms of Reference (TOR) related to the Human Immunodeficiency Virus (HIV) and its endstage disease, Acquired Immunodeficiency Syndrome (AIDS) (see Appendix A):

1. Could the manpower pool for the Army be seriously depleted by a critical prevalence of HIV infection in the population? What is the likelihood that this could occur?
2. Can the Army benefit from the study on AIDS by the Presidential Commission? If so, how?
3. What specific parts of the world present a known threat due to the prevalence of AIDS in that area?
4. When deployment into a third world area and/or into a known AIDS threat area is planned, what issues involving blood supplies need to be considered?
5. What are the high leverage AIDS preventive measures that the Army can take?
6. Should personnel with HIV be eliminated from deployment into combat?

The Ad Hoc Subgroup on Threat of AIDS on Operational Deployment of Army Forces to a Theater of the Army Science Board was formed (see Appendix B) and met on six separate occasions over several months. Presentations were made to the Subgroup by the intelligence, medical, and operational communities. Data were reviewed on the pathogenesis of infection, progression of disease, epidemiology and associated risk factors, and the international distribution of HIV infection. Presentations also included discussions of current knowledge of HIV infection and how this infection affects the U.S. military; Army policies on the testing, evaluation, treatment, and disposition of HIV-infected soldiers and family members; and current and projected preventive and educational efforts.

Current and proposed Army research efforts were described in detail, particularly contributions of Army research to the

understanding of the natural history and epidemiology of HIV.

The Subgroup found that a report which followed the outline implied by the above cited TORs would be overly constraining due to the complexity and interrelationships of the issues raised by HIV and AIDS. Instead, the Subgroup's report is organized under three major headings: Combat Readiness; Medical Care and Disease Intervention; and Research. These topics encompass the significant choices and challenges presented to the Army by the HIV pandemic.

COMBAT READINESS

GLOBAL THREAT

FINDINGS

F-1. Global Distribution of HIV Infection. HIV infection is distributed worldwide, and the infection will predictably continue to spread. Its assured endpoint, AIDS, has already caused social and political instability in parts of the world. The highest concentrations of the disease include much of Sub-Saharan Africa and parts of the Caribbean, with serious epidemics underway in parts of Latin America, Europe, Southeast Asia, and in certain urban centers in the United States. Central and South America are of particular interest, because the infection may cause future instability in this hemisphere.

F-2. Need for Medical Intelligence. Accurate information does not exist on the epidemiology of HIV infection in specific countries or regions. This is due, in part, to limited HIV testing capabilities in these countries, and/or hesitancy on the part of certain foreign governments to disclose information on AIDS.

F-3. Sharing of Medical Intelligence. Communication between the medical research and the intelligence communities is poor. While information on HIV prevalence is often politically and militarily sensitive, current information on the incidence and prevalence of HIV infection can be invaluable in the formulation and implementation of military programs and activities.

DISCUSSION

HIV infection caused by the HIV-1 virus has now been reported in nearly every country. The World Health Organization estimates that at least five million people in the world are infected with HIV, but many observers believe this figure may be considerably understated. At least one million new cases are expected by 1993, and the number of cases will continue to rise exponentially in many geographical regions. Many represent locations where U.S. military involvement may be required in the future, where national security interests are a concern, or where infection has already had a significant impact on the socioeconomic and defense posture. HIV infection is clearly a disease of military importance.

Many areas of the world have been severely affected by HIV infection and AIDS. Sub-Saharan Africa has been the hardest hit, with dramatic changes in the socioeconomic structure of

many central African nations with young and middle aged adults being infected. AIDS is already exerting a destabilizing influence on the political structure of several African nations. HIV infection has spread throughout Europe and has been reported in the U.S.S.R. and Eastern Bloc countries. Data on the prevalence of infection in the Far East are limited, but some studies indicate high rates in prostitute and/or intravenous drug-using populations in several Far Eastern countries (Philippines and Thailand). HIV-2, another retrovirus different from HIV-1, has now been identified in West Africa.

Rates of HIV infection are increasing throughout Latin America and the Caribbean and have reached epidemic proportions in specific areas of Brazil, the Bahamas, French Guiana, and Haiti. The association with drug abuse in Latin America is ill-defined at this time. A continued increase in the incidence of disease in Africa, Latin America, the Caribbean, and the Far East will impact significantly on the defense posture of affected nations, and potentially on the U.S. Army. It is, therefore, in the best interests of the Department of Defense and the U.S. Army to be actively involved in the international effort to prevent HIV infection and AIDS.

The urgency and the potential impact that epidemiological data may have upon deployment and actions to limit exposure make it imperative that all sources of HIV information be used in a joint collection effort. With an ever-changing global power structure and political instability in many areas, the data must be current and accurate. We note that often the best foreign data in terms of recent testing results, and especially of prevalence figures for foreign military populations come from military medical liaison agreements. These data, and non-military epidemiological intelligence are poorly coupled. No good analysis process for these critical complementary data sources exists. Thus, an important potential for harmonization and reconciliation of data leading possibly toward a greater than additive benefit of such analyses, based on a more complete picture of worldwide epidemiological developments, is being missed.

RECOMMENDATIONS

R-1. International Preventive Efforts. The Army should continue to encourage all nations to pursue testing of all blood supplies for HIV antibody, and to develop health education programs on AIDS. Screening of allied foreign military forces for HIV infection should be adopted to identify the extent of infection within any units that might possibly be involved in joint exercises.

R-2. Prevention Among U.S. Soldiers. The Army should expand its prevention programs for soldiers with more aggressive, innovative, and effective preventive strategies. Special programs, policies, and emphasis are required for personnel operating in geographical areas with high HIV prevalence. Periodic assessments and adjustments of these strategies to meet changing needs must be a part of the overall effort.

R-3. Joint Operations with Foreign Military. The DoD, in coordination with other federal agencies, departments, and services, should develop policies relative to joint operations and activities with foreign military forces that have not been screened for HIV infection. The feasibility of U.S.-financed and U.S.-assisted HIV testing and blood donor screening programs should be explored.

R-4. Global HIV Information. As the Lead Agency for medical research on HIV infection for the Department of Defense, the Army should coordinate DOD-wide collection and analyses of medical research data related to HIV infection in geographical areas of potential peacetime or wartime national interest. These data should be provided on a regular basis to appropriate government agencies.

R-5. HIV Data Acquisition by Laboratories. Collection of HIV information in overseas areas may be politically sensitive. Nonetheless, acquisition of HIV information that could potentially impact on U.S. military operations or personnel should be one of the principal goals of U.S. military-operated laboratories. Gathering of HIV information by overseas laboratories should be intensified and the data shared with intelligence gathering bodies.

R-6. HIV Database. The Army should maintain a current operational database that provides the most reliable information on HIV prevalence in all areas of potential peacetime or wartime deployments.

R-7. Modeling. The Army, in cooperation with other agencies, should develop or acquire epidemiological models that are specific to areas of potential peacetime or wartime deployments. The models should be based on accurate and current information and should project trends in the incidence and prevalence of HIV infection in local populations.

COMBAT READINESS

MANPOWER

FINDINGS

F-4. Manpower. Assuming that the current policy of non-accession of HIV-infected applicants is continued, that recruitment quotas are not increased, and that the prevalence of HIV infection over the next several years remains below 2/1000 among eligible personnel, it is unlikely that recruitment will be significantly compromised by the current prevalence of HIV infection in the U.S. population. Taken as a whole, HIV infection rates, in the near term, will have a very small effect on the total number of eligible persons available for recruitment.

F-5. Performance. At this time, no substantive evidence exists indicating that HIV-infected personnel in Walter Reed stages 1 or 2 are adversely affected by their infection in their performance of duty. Soldiers with early stages of HIV infection are not disabled on the basis of HIV antibody positivity. However, unit performance may be affected, since deployability limitations are placed on these individuals. The presence of HIV-infected soldiers may create unknown morale effects within the unit.

F-6. Confidentiality. Maintaining confidentiality of HIV test results and contact information obtained as a part of the epidemiological interviews continues to be a problem in the Army, as for other health care organizations. Medical information currently is not considered to be "privileged" or protected from involuntary disclosure in the same sense as communication between an attorney and his client, and protection of sensitive personal information which is revealed during medical interviews cannot therefore be assured. The inability to adequately protect information regarding the source of infection interferes with the voluntary release of such information by infected individuals and followup of their contacts.

DISCUSSION

At the request of the Subgroup, an assessment of the impact of HIV infection on enlisted and officer accessions was performed by ODCSPER. Eight to ten percent of recruit applicants are currently disqualified for non-medical reasons. Approximately six percent of the applicant population is disqualified for medical reasons (including HIV infection).

During the period October 1985 through March 1989, 11.5% of more than two million applicants for military service had one or more conditions that were reported with "medical failure codes." This data was derived from Monthly Service Tapes, Military Entrance Processing Reporting System, compiled during the period October 1985 through March 1989. Changes in the prevalence of HIV infection in applicant pools do not appear to have a major impact on overall recruitment (see results of modeling efforts in Appendix E). Therefore, HIV infection is not currently judged to be a limiting factor in recruitment by ODCSPER. If mobilization results in reinstitution of the draft, recruitment targets will still be achieved, although the exclusion of HIV infected individuals from service may present other problems.

Current overall prevalence rates of HIV infection for applicants for military service ages 18 through 24 are below 1.5/1000. However, in some urban areas, the prevalence is as high as 20/1000. It is the continuing rise of HIV incidence in the high prevalence urban areas that is of concern, since the Army draws a significant proportion of its recruits from such urban areas. Since known HIV-infected persons will not be applying for or will be denied entry into the volunteer Army, the effect of HIV on recruitment could be amplified when the Army is barely achieving its recruitment goals. Some observers suggest that prevalence of infection among military applicants may be only one-fourth of the prevalence of HIV infection in the community as a whole. Recent surveys of civilian emergency room patients support this assessment. Kelen et al reported finding very large numbers of unexpected HIV infected patients in an article in the June 23, 1988, issue of the New England Journal of Medicine titled "Unrecognized Human Immunodeficiency Virus Infection in Emergency Department Patients."

During the last quarter of 1988, the Army for the first time in eight years was not able to fulfill its enlistment quotas. The situation was expected to worsen with increasingly more attractive employment opportunities outside of the military, diminishing military benefits, and a declining manpower pool in the ages 18 through 24 years. When previously faced with such shortfalls, the Army was forced to accept more volunteers in the lowest acceptable category (Category IV). At some point in the future, this trend could pressure the Army toward troop strength reductions or lowering of standards. The military could be faced with the prospect of reinstituting the draft (or some form of compulsory military service), drafting women, recalling retirees, or limiting troop strengths. In such a situation the Army would need to reexamine the current policy of non-accession of HIV-infected persons. Increasing pressure for such re-examination would occur as a function of success in finding clinical measures to slow progression of the disease in Walter Reed stages 1 and 2. However, anticipated reductions in Army

personnel strength in FY 90 and beyond, will substantially reduce the required number of recruits, thus minimizing any need for accessing HIV-infected persons in the immediate future.

If the possibility exists that HIV-infected persons must become and/or remain functional members of the Armed Forces, then experience in dealing with such persons in its ranks is a prerequisite. The physical capabilities and the psychosocial impact on both the infected and non-infected must be understood. Despite current ODCSPER projections of not needing to access HIV-infected persons, the Army must be prepared to face the possibility of the need to integrate HIV-infected individuals at some time.

Confidentiality continues to be a difficult issue, and the situation worsens during times of deployment or reassignment. Confidentiality of test results may not be possible during mobilization. Contact information obtained as a part of the epidemiological assessment or interview is often incomplete, since patients often choose not to disclose the identity of their sexual or drug-use-related contacts. As a result, such contacts may not be notified by public health authorities of their potential exposure to HIV infection. This is inconsistent with good public health practice since it does nothing to limit spread of the infection.

RECOMMENDATIONS

R-8. Evaluation of Issues. As the Army must be prepared to face the possibility of accession of HIV-infected personnel sometime in the future, the Army should fully evaluate the medical, physiological, psychological, performance, operational, and command issues which accompany the retention of HIV-infected soldiers in active and reserve units. This should be accomplished through well-designed and unbiased studies and evaluations.

R-9. Retention. On the basis of new medical, physiological, psychological, and performance information obtained through medical research and Army experience, the Army should continually reassess its current policy on retention of HIV-infected soldiers. But for now, in the absence of compelling scientific information supporting unfitness of soldiers with early HIV infection, it is the opinion of the majority of the Subgroup that the Army should not seek a change in the current DoD policy of retention of HIV-infected soldiers with early infection. Medical and personal support services should continue to be provided to the HIV-infected soldier and their

families for the remainder of his or her time on duty. This would ensure the maximum possible utilization of the soldier's skills and training and recoupment of the investment by the Army.

R-10. Army HIV Testing Program. The Army, in cooperation with other services, should continue its policy of HIV testing of applicants for military service and periodic screening of active duty and reserve component personnel. The frequency of force testing should be based on evidence of the incidence of infection. The need for early identification and counseling, and prevention of transmission and progression of infection, should be emphasized during testing.

R-11. Confidentiality. The Army should continue to search for reliable ways of protecting the confidentiality of HIV test results and information obtained as part of the epidemiological assessment or interview. The Army should reassess its current policy on "privileged" information and consider including as privileged all information provided during an epidemiological interview, unless national security is endangered. Clear guidelines should be provided to all personnel currently allowed to receive privileged information when HIV exposure is suggested or indicated.

COMBAT READINESS

DEPLOYABILITY

FINDINGS

F-7. Deployability of HIV-Infected Soldiers. Army policies contained in AR 600-110 reflect current DOD policy by precluding the temporary or permanent assignment of HIV-infected soldiers outside the United States and prohibiting their assignment within the United States to Special Operations Command units and COHORT units scheduled for overseas rotation. Soldiers who are found to be HIV-positive while assigned to a deployable unit remain in those units, while in CONUS, but do not accompany the unit when it is deployed overseas. Army policy further prohibits assignment of HIV-infected soldiers to advanced civil schooling and fellowships. ODCSPER has recently changed Army policy to permit HIV-infected soldiers to be retrained and reclassified into other military occupational specialities and skills in accordance with the needs of the Army. While the nondeployability policy limits assignment opportunities for HIV-infected soldiers, the change in policy to permit reclassification and retraining provides expanded career opportunities more in keeping with those available to non-infected soldiers. Even with the above changes taken together, these requirements still remain unrealistic and inconsistent with retention and maintenance of confidentiality, and have caused considerable difficulty for commanders.

F-8. Risks to Deployed Personnel. Military personnel are at some increased risk if they are deployed to areas of the world with a high prevalence of HIV infection. The level of risk is directly related to the degree of sexual and/or blood exposure. No evidence exists that the infection can be transmitted by arthropods. The full risks of HIV infection to fellow soldiers during situations of combat trauma are unknown.

F-9. Reserve Component Personnel. Under current DOD policy Reserve and National Guard personnel diagnosed as HIV-infected cannot be administered in the same manner as active duty counterparts. Detection of HIV infection could result in immediate transfer to an Active Standby Reserve status for an otherwise fit Reservist or National Guardsman if a nondeployable position were not immediately available.

DISCUSSION

The management of the roles of HIV-infected soldiers in the different Army components, under various operational situations in such a way as to maintain adequate combat readiness, remains a major problem facing the Army. The Army continues to struggle with this difficult problem of meeting its mission of readiness, yet assuring that a non-discriminatory environment persists. Situations that must be considered include: CONUS peacetime assignments; OCONUS peacetime deployments; limited war or police actions; major mobilization for total war; and full-scale or total war. Manpower requirements will differ for each situation. In addition, the role of the HIV-infected soldier in the overall Army effort remains to be fully resolved.

The decision not to deploy HIV-infected soldiers overseas for exercises or permanent duty assignment has been based on real and theoretical medical and unit integrity concerns, and on diplomatic considerations. Peacetime training missions carry different risks than actual combat situations where casualties may increase the potential for blood-borne transmission of HIV. It is also recognized that the military trains for war, and deployment of individuals during peacetime, who would otherwise not be deployed during mobilization or a real-world mission, would be inconsistent with this mission.

HIV-infected individuals in the early stages of disease require medical evaluation at least annually at an Army medical center, a consideration in making assignments to select units and more remote locations. The possibility of transmission of HIV infection through sexual interaction with the local population is also of concern in the assignment of infected personnel, especially with assignments to geographical areas with low prevalence of HIV infection and high diplomatic sensitivity. The military runs the risk of being accused of promoting importation of HIV infection to a host country.

It has been the strategy of the Department of the Army to avoid situations that would suggest discrimination for any condition unless essential to maintenance of readiness. No decision to send HIV-infected soldiers into combat can be made with any degree of conviction at this time due to limited data and experience. As the research continues and infected individuals are followed, more information will be accumulated on which to base additional policies supported by medical, demographic, and epidemiological facts.

Preventive measures, to include personal hygiene, personal protective measures, sanitation, vector control, immunizations, and drug chemoprophylaxis against specific diseases, provide

satisfactory protection against most exotic diseases in healthy individuals. It is uncertain if HIV-infected individuals in the early stages of infection are equally protected, if they are at increased risk of accelerating their HIV infection, or if they are at increased risk of contracting such exotic diseases. Neurological symptoms occasionally noted during the earlier stages of infection raise questions about the assignment of HIV-infected soldiers in critical skill areas associated with high stress and performance demands, but, again, data are limited or unavailable.

Current HIV testing policy screens all active duty and reserve component personnel biennially, or at specified points in time (within two years prior to any temporary OCONUS deployment; within six months of permanent assignment OCONUS, accession into the Army, or assignment to special schooling; always when medically indicated; and every five years with the periodic physical examination). Soldiers found to be HIV-infected are classified as non-deployable and are not assigned to overseas areas.

Reserve component soldiers pose unique difficulties when found to be HIV-infected. By DOD directive, these soldiers may not undergo evaluation for HIV-infection unless on active duty for an extended period. Since fitness for duty could not be assessed easily under these rules, a policy of immediate transfer to the active standby reserve was adopted. That policy has now been replaced at DOD direction with a policy of permitting these soldiers to compete for an appropriate non-deployable billet when found to be physically fit. Initial and periodic evaluations are conducted at the soldier's expense according to a protocol developed by OTSG. Cumulative results of routine and overseas deployment HIV antibody testing, as of June 1989, reveal an overall seroprevalence of 1.70 per thousand among Reserve soldiers and 1.48 per thousand among National Guard soldiers in an analysis performed by MAJ David Cowan of the Walter Reed Army Institute of Research. There is some concern that the ongoing screening program will reveal that overall prevalence and incidence in the Reserve component will be higher than for the active duty population.

The welfare of the HIV-infected soldier must be balanced against the health and welfare of fellow soldiers and the real-world needs and expectations of the Army. To formulate one universal policy, considering both the Army's mission and the rights of the individual soldier, which accomplishes both goals, is difficult. Therefore, three options were identified by the Subgroup and are presented here for consideration by Army leadership. All of these options go beyond current Army policy.

Option 1: The Army should immediately place each HIV-infected soldier on disability retirement as soon as

infection has been detected and assist him or her in civilian job placement. Currently, disability retirement (or placement on the temporary disability retired list (TDRL) status) is considered only when a soldier is immunocompromised or unable to perform his or her military occupation in a satisfactory manner.

Advantages: removes all known HIV-infected soldiers from Army rolls as soon as diagnosed; avoids problems with OCONUS deployments; simplifies management of HIV-infected personnel; reduces possibilities of spreading HIV infection within the Army; allows soldier with early HIV infection to integrate into civilian life with continued military medical support.

Disadvantages: costly; requires special program if post career assistance is necessary; removes personnel from their military job without any clear medical justification, and thus may be viewed as unnecessarily discriminatory; requires legislation to change disability discharge rules; contradictory to current DoD policy on retention of HIV-infected personnel.

Option 2: The Army should, with new training as required, immediately reassign all HIV-infected soldiers to non-deployable Army units of the soldier's choice as soon as infection is detected.

Advantages: enhances the readiness of deployable units; avoids problems with OCONUS deployment of known HIV-infected personnel; allows soldiers to remain on active duty until clearly disabled or immunocompromised; allows utilization of at least a portion of each soldier's training; permits HIV-infected soldier to have some influence on his or her next assignment.

Disadvantages: creates personnel management and training problems, especially if a change in military occupational specialty (MOS) is necessary; does not eliminate possibility of spread of HIV infection from the infected soldier; remains difficult to maintain confidentiality; may be interpreted as discriminatory, especially if commands restrict reassignments to only a few units; does not allow for true integration of soldiers based on their original MOS, as required by current DOD policy.

Option 3: The Army should allow HIV-infected soldiers to remain on active duty as long as they can perform their assigned duties, including being deployed to overseas areas.

Advantages: non-discriminatory; allows for integration of soldiers based on current MOS; maximizes confidentiality; fewer personnel management problems for commanders.

Disadvantages: will not be well-received by some foreign nations; does not eliminate the possibility of transmission of HIV infection to other soldiers; infected soldiers may not be able to carry out some critical missions during combat; possibility of aggravation of HIV infection with exposure to exotic infections; inability to immunize against certain diseases in HIV-infected persons, placing them at increased risk; may disturb unit integrity and limit cohesiveness during critical times. (Note: some of these disadvantages are based on theoretical medical concerns; no medical data currently exist to unequivocally support these assertions).

It is clearly evident that there is no simple solution to the problem of deployment of HIV-infected personnel. Weighting factors for the various advantages and disadvantages must be assigned based on the Army's priorities. If assured combat readiness is the controlling factor, the best solution is Option 1. If assured confidentiality and avoidance of discrimination are the controlling factors, Option 3 should be chosen. If an intermediate position on confidentiality and discrimination and combat effectiveness is deemed to be the controlling factor, Option 2 should be selected. On balance, the majority of the subgroup favors Option 2.

RECOMMENDATIONS

R-12. Deployability Policies. The Army should establish unambiguous policies that resolve the conflicts between current personnel policies related to deployment, unit integration, and confidentiality. These policies should be realistic within the setting of today's Army and potential contingencies, and commanders should be provided detailed guidance on personnel management of HIV-infected soldiers.

R-13. Non-Deployability of HIV-Infected Soldiers. The current national posture toward HIV infection, concern over potential discrimination, and theoretical but unsubstantiated concerns over medical risks indicate that, for now, the Army should continue its present policy of not deploying HIV-infected soldiers OCONUS. However, consideration should be given to allowing non-symptomatic HIV-infected soldiers an opportunity to change his/her Military Occupational Specialty, consistent with this new status.

R-14. Unit Morale and Performance. The Army should develop better data on the behavior of Army personnel and on the psychological and performance problems of HIV-infected soldiers and of uninfected soldiers who serve with them. This should

include assessments of the impact of suspected or actual HIV infection within a unit and its impact on unit morale and cohesion.

R-15. Disability. In the event that the Army is seriously considering option one, it should explore the feasibility of obtaining disability for asymptomatic HIV-infected soldiers as early as possible.

R-16. Army Reserve Personnel. DOD should consider changing its policies or recommending appropriate legislative changes to allow HIV-related policies and regulations for the Army National Guard and the Army Reserve to be consistent with those of the Regular Army to the maximum extent possible. Consistency should be applied to policies for the periodic testing, evaluation of HIV-infected persons, assignment of HIV-infected personnel, opportunities for advancement and training, and utilization of such personnel during times of crisis.

COMBAT READINESS

BLOOD SUPPLY

FINDING

F-10. Blood Supply During Deployments. Blood supply issues have not been fully addressed relative to areas of the world with a high prevalence and incidence of HIV infection. While military operations have well-defined blood replacement requirements coordinated through the Armed Services Blood Program Office (ASBPO), it is not clear if these requirements can be met. Despite the availability of frozen blood supplies, fresh whole blood is still necessary in emergencies. Small unit deployments constitute special blood replacement problems, especially when they occur in remote areas.

DISCUSSION

Blood supplies in a battlefield scenario or in a peacetime deployment are of great concern. The Armed Services Blood Program Office (ASBPO) has as its mission the responsibility of assuring that safe blood supplies are available during major exercises and deployments. This is not always possible, however. Blood issues include: (1) the availability of HIV-negative blood that has been tested by U.S. Army standards; (2) prior identification of HIV-infected persons as "donor-ineligible"; (3) transfusion of blood and/or blood products from non-U.S. donors in emergency situations; (4) the absence of HIV screening capabilities in the field; (5) practical limitations on the use of frozen blood in emergencies and emergency availability of critical clotting factors and platelets inactivated by the freezing process; and (6) the possibility that tests may miss detection of the presence of HIV virus particles in blood donated after infection but prior to development of antibodies.

"Donor ineligible" status is not unique to HIV-infected individuals, as other medical conditions, such as hepatitis B antigen-positive carrier status, hepatitis B core antibody (surrogate marker for non-A non-B hepatitis), recent travel to a malaria area, and other untreated blood-borne diseases disqualify persons as donors. HIV-infected individuals or other persons who would fall in a high risk category for transmitting some blood-borne infection are barred from donating any blood, tissues, or organs.

RECOMMENDATIONS

R-17. Blood Supply. The Army, supported by ASBPO, should have a clearly defined transfusion policy on the use or non-use of donated blood obtained from specific foreign sources. This policy should be developed in coordination with other federal agencies and cooperative nations.

R-18. Blood Transfusion Policy. The Army should exercise the transfusion policy against the various mobilization scenarios to provide confidence that the policies are feasible.

R-19. Sources of Whole Blood. Potential donors within deployed units and at permanent foreign stations should be readily identifiable. Other sources of fresh blood should be examined for use in those emergencies when fresh whole blood is necessary.

R-20. Joint Blood Supply Safety. The Army should explore the feasibility of U.S.-supported HIV blood testing programs of the forces of cooperative nations participating regularly in joint operations with the Army. Such an effort would provide invaluable information to nations attempting to develop testing programs and would provide information on the quality of international blood supplies.

MEDICAL CARE AND DISEASE INTERVENTION

MEDICAL TREATMENT

FINDINGS

F-11. Presidential Commission on the HIV Epidemic. The Army's activities support the recommendations of the Presidential Commission on the Human Immunodeficiency Virus Epidemic, released on 24 June 1988. In all important instances, the Army has taken the lead in gathering and utilizing data related to HIV infection.

F-12. Treatment of HIV-Infected Individuals. Current Army efforts to identify, evaluate medically, treat, and follow HIV-infected individuals are excellent. At the same time there is increasing evidence that there is a need by the patient and his/her family for psychosocial support and counseling to assist them through the process of coping with the disease.

F-13. Medical Program Resources. Health costs will continue to escalate for the foreseeable future, and will be felt primarily by the Army Medical Department. The health care costs will rise even if the Army were to choose to eliminate HIV-infected soldiers at an earlier stage of infection.

F-14. HIV-Infected Family Members. A growing problem for the Army is the increasing number of cases of HIV infection among its family members. The full impact of HIV infection in family members has not been adequately addressed. Over 40% of HIV-infected soldiers are married, and many of the spouses are also infected. The Army is encountering more frequent problems with the placement and care of both HIV-infected and uninfected infants and young children of HIV-infected parents who are hospitalized. Child development centers do not allow HIV-infected children to remain in their facilities.

DISCUSSION

The Presidential Commission Report reinforces areas of concern recognized by the Army for some time in the areas of diagnosis, treatment, and prevention of HIV infection. Aspects of the Army's program that have received national attention include: emphasis on early diagnosis of HIV infection; ready availability of HIV tests and expanded testing in special settings, such as sexually transmitted disease clinics; collection of epidemiological data on HIV infection; development of the Walter Reed Classification, a system now used worldwide

to follow the progression of HIV infection; aggressive partner notification strategies; biomedical research and clinical trials; emphasis on safety of the blood supply; and implementation of educational programs.

The Army has been criticized for its aggressiveness in identification of infection, meticulous confirmation of infection with retesting, concern over heterosexual transmission, and the need for contact notification (to include civilians), but the policies and approaches have "withstood the test of time," and are endorsed by the Presidential Commission.

In the Army setting, estimates developed by the Walter Reed Army Institute of Research indicate that the cost per patient in the military setting will be over \$130,000 from diagnosis to death (see Appendix F), not including costs related to replacement of lost skills which are estimated in Appendix G. GAO report HRD-90-39, February 1990, estimates average hospital costs over the lifetime of an AIDS patient have ranged from \$25,000 to \$147,000. The reason that the Army cost estimates are on the high side of the range cited in the GAO report is that the Army detects the HIV-positive patient early, and, therefore, must provide care for a longer period.

A projected incidence of up to 500 or more new cases per year in the active duty Army population does not include family members or retirees, including retirees of other branches of the military, who may elect to obtain medical care at Army medical treatment facilities. The inpatient and outpatient resources to support these patients (i.e., physiological, psychosocial and family support) are critical. Although the numbers are small, a part of this issue is an increasing number of soldiers who have cited their HIV-infected status as their reason for attempting suicide. New drugs will continue to be expensive, and their therapeutic use requires a close link with research programs.

An increasing problem for Army medical treatment facilities, particularly Army medical centers and larger installations, is the need to provide support to both infected and uninfected family members of HIV-infected soldiers. The United States Army HIV Database System, maintained at WRAIR, indicates that 440 (48%) of 913 soldiers ever diagnosed with HIV infection were reported to be married at the time of their most recent clinical evaluation, with many of their spouses also being infected. Among 65 families evaluated at Walter Reed Army Medical Center, 50% of the spouses of male index cases were HIV antibody positive. G. Pettett, J. Brundage, R. Miller, et al, explored the growth of family members as an important beneficiary group in their presentation "An Empiric Model for HIV Infection in a Low-risk Military Population with Emphasis on Heterosexual and Perinatal Transmission" given at the 5th National Pediatric AIDS Conference, Los Angeles, California, September 6-8, 1989.

The Army is encountering more frequent problems with the placement and care of both HIV-infected and uninfected infants and young children of HIV-infected parents who are hospitalized. Child care assistance for infected infants and young children is an especially difficult problem, since family-based support is usually unavailable and most child development centers do not admit HIV-infected infants or children below age six. When special facilities are available, costs for care are usually high. The full impact of family support problems associated with HIV infection has yet to be recognized by the Army.

RECOMMENDATIONS

R-21. Presidential Commission Report. The Army can and should use the Presidential Commission Report to support and emphasize the need for a coordinated and aggressive preventive effort against HIV and the need for continued and expanded HIV research. The Army is in a unique position to continue making invaluable contributions to the understanding and prevention of HIV infection and must be appropriately supported in both operational and research programs.

R-22. Psychosocial Support and Counseling. The Army should increasingly emphasize, within the medical support of the HIV-infected patient and his or her family, the provision of psychosocial support and counseling to help them cope with the diagnoses and progression of the disease.

R-23. Medical Program Resources. The Army must continuously program the financial and personnel resources required to care for HIV-infected soldiers, retirees, family members, and other beneficiaries. This should be done in coordination with the other services and the Veterans Administration.

R-24. HIV-Infected Family Members. The Army should request expansion of its budget for care of family members who are HIV-infected. In particular, the impact of the care of HIV-infected infants on current resources and the Exceptional Family Member Program must be carefully evaluated, so other community support programs will not be compromised. The Army must evaluate its overall policies and programs, to include medical support and social services affecting family members.

MEDICAL CARE AND DISEASE INTERVENTION

PREVENTION

FINDINGS

F-15. Health Education and Primary Prevention. The Army has a limited HIV awareness program directed at primary prevention of HIV infection in the Army community. Although the Army recognized the preventive value of education early in its battle against HIV, little recent progress is evident. A particularly significant preventive challenge is highlighted by the fact that a substantial proportion of HIV-infected military personnel are married. The spouses of these personnel are at a significant risk of contracting HIV infection through heterosexual transmission and account for a significant number of the total number of cases in the Army community.

F-16. Secondary Prevention. The Army, through its testing program, identifies cases of HIV infection during the early stages, often before symptoms are evident. Effort is placed on secondary prevention, through early intervention, i.e., the prevention of disease progression from early infection to AIDS. This intervention is closely linked with clinical evaluation of new drugs that can accomplish this purpose.

DISCUSSION

Preventive measures rely heavily on intervention and health education of the forces. Prevention is theoretically possible through: (1) behavior modification; (2) vaccines; or (3) prophylactic drugs. The need to influence personal behavior is of paramount importance. Since the inception of the Army HIV program, it has been explicitly clear that the only available defense against HIV infection is health education and a subsequent behavioral change. Vaccines, chemoprophylactic drugs, and curative therapies are only now on the horizon. Soldiers must therefore be instilled with the urgency of practicing responsible behavior to avoid unnecessary risks.

The major high leverage AIDS preventive measures that the Army has recognized include the development of vaccines or drug chemoprophylaxis and effective educational methods that will effect a change to low risk behavior. Another aspect of prevention, however, involves arresting progression of infection in those already infected and the prevention of further transmission to others.

As a result of its aggressive screening programs, the U.S. military is the only large population in the world in which the true prevalence and incidence of HIV are known. The military is thus an ideal setting to evaluate the success or failure of primary or secondary preventive measures.

In addition to the human cost of suffering and potential for transmission of infection to others, the cumulative dollar cost for HIV infection in a military member includes medical care for the member and the member's family, the costs of recruitment, costs of basic military and specialty training, and disability retirement. Assuming stability of critical factors that determine the impact of the epidemic (e.g., the rate of incidence of new HIV infections, the rate of disease progression, the frequency and intensity of HIV screening), a simple empirical model developed by Miller, R.N., et al, Walter Reed Army Institute of Research, projects that annual costs to the Army associated with HIV infection will steadily rise over the next ten years. The model has been used to project HIV associated morbidity, mortality and costs in various presentations, including this Army Science Board Ad Hoc Committee and the Armed Forces Epidemiology Board.

RECOMMENDATIONS

R-25. National Prevention Effort. The Army should continue to cooperate with public and private intervention programs to reduce the national prevalence of HIV infection. Further, it should voluntarily make its data available to guide and persuade the civilian sector that this is a common program from which a great deal can be learned and upon which future public intervention activities can be built.

R-26. Prevention of Disease Progression. For those early stage patients (Walter Reed Stages 1 and 2) in the military who are identified through mandatory testing programs and who undergo regular re-evaluation, Army emphasis should be on prevention of progression of early disease (secondary prevention).

R-27. Spouses of HIV-Infected Service Personnel. The population of HIV-infected personnel and their spouses should be carefully studied to identify factors associated with heterosexual transmission and the efficacy of intervention efforts.

R-28. Health Education. The distribution of general information materials on HIV infection and AIDS is not sufficient. The Army needs new and innovative programs directed

at behavior modification, since no methods exist to cure HIV-infected individuals, no prophylactic drugs or vaccines are available, and current programs have not been demonstrably successful.

R-29. Behavioral Change. Efforts to effect widescale changes in behavior must be directed at all levels of the Army structure, from senior commanders to troops. These efforts must be targeted at modifying high risk behaviors. Influencing behavioral change requires a moral as well as a policy commitment from senior Army leadership to keep soldiers from contracting this deadly illness.

R-30. Health Education Needs. The Army HIV educational effort requires command support. Updated informational materials, based on behavioral research, should be developed by medical personnel assisted by behavioral and educational professionals. A professional community-based educational program is indicated, with program assessment being a critical part. The educational effort must be adequately supported by budgets and personnel.

R-31. Scope of Health Education Efforts. The Army educational effort must be broad in scope and reach all sectors of the military community. The program should include all soldiers (officers and enlisted, active duty, and reserves), commanders and supervisors, family members, retirees and their family members, and civilian employees. The educational materials must be medically accurate and should be targeted to specific needs. Programs must be adapted to specific groups and their level of understanding and may require the presentation of graphic or sexually explicit materials to achieve their goals.

RESEARCH

READINESS ISSUES

FINDINGS

F-17. Medical Research Effort. The Army research program on HIV infection addresses readiness issues by emphasizing prevention of infection in the military, through the development of a vaccine, prophylactic drugs, and strategies to change high risk behavior to low risk behavior. An limited effort is directed at the prevention of blood-transmissible infections through rapid field diagnosis and/or prophylactic drug treatment. The Army has made considerable progress in several areas, such as vaccine development and clinical evaluation of potential therapeutic and prophylactic drugs. In addition, the Walter Reed Staging System developed by the Army has helped characterize the natural history of HIV infection.

F-18. Readiness and Research. To date, no medical and little behavioral research has been directed at specific issues of readiness. No medical data exist that unequivocally place soldiers with early HIV infection (e. g., Walter Reed stages 1 and 2) at increased medical risk during deployment to OCONUS areas or on special assignments. There exists a common belief, however, that both accidental and combat-related trauma of HIV-infected soldiers might increase risk of acquisition of infection by fellow soldiers.

F-19. Drug Interventions. The Army has an ongoing research effort evaluating promising drugs that may have applicability within the military setting.

F-20. Blood Supply. The Army lacks a rapid and highly sensitive blood screening test for HIV that can be used in a field setting, particularly to screen freshly collected blood for emergency transfusions. Frozen blood and blood products, as well as transported whole blood, are inadequate in many battlefield situations, especially for control of bleeding of seriously wounded soldiers.

DISCUSSION

HIV infection has militarily unique aspects that can adversely affect readiness in the future. The major research efforts by other governmental and academic agencies do not address the military unique aspects. Specifically, the focus of the Department of Health and Human Services (DHHS) research programs are on the treatment of later stage disease (i.e., AIDS), in contrast to the Army's research, focusing on early detection, prevention and intervention. The primary goal of the DHHS program is to sustain the life of those infected, whereas the Army's research goals are to prevent infection and to sustain performance and productivity.

The DHHS research program differs from the Army's program, as follows:

- (1) Natural History - DHHS efforts center on subgroups, such as homosexual men, versus the entire military beneficiary population.
- (2) Epidemiology - DHHS efforts focus on late disease (WR stage 6) versus Army efforts emphasizing early infection (WR stages 1-4).
- (3) Diagnosis - The DHHS emphasis is on late stage disease versus early infection (including early identification).
- (4) Blood Program - The DHHS and civilian blood collection programs are time insensitive, while the Army program emphasizes rapid and reliable field identification.
- (5) Vaccines - The Army has emphasized evaluation of vaccine efficacy and immunogenicity in adult populations.
- (6) Drugs - A great deal of the DHHS effort is directed at treatment, versus pre- and post-exposure prophylaxis.
- (7) Behavior Modification - The Army effort is directed at promoting "good" behavior in a controlled general population, not necessarily at high risk subgroups such as male homosexuals or intravenous drug abusers.
- (8) Database - The Army has created a large military unique database that provides invaluable information to project progression of HIV and, indirectly, retainability of service personnel.

In short, since the national program is not responding to militarily unique needs, the goals of the Army's program are tailored to conserving the fighting force. The Army program is complementary, not duplicative. Furthermore, the program directors serve as members of the drug evaluation and vaccine review committees of the National Institutes of Health, the AIDS review committee of the National Academy of Science, the Infectious Disease Society of America, the Veterans Administration, and the World Health Organization, and are able to ensure that the Army's efforts are coordinated but not duplicated.

An Army Medical Research and Development Command-sponsored consensus conference was held in November 1988 in Hagerstown, Maryland, to develop a five-year plan for retrovirus research (Appendix D). Since development and implementation of the plan, the Army has actively pursued involvement of the other services in the HIV research program. Several tri-service efforts are now in place to address issues of shared military concern. A gp160 vaccine immunotherapy trial for individuals with early stages of HIV infection is now being implemented, as well as investigations on the use of zidovudine (AZT) and other promising therapeutic drugs.

The unanswered questions on readiness and the necessity for the Army to respond on short notice to a wide spectrum of crises demand a more focused and dedicated research effort to answer several specific critical questions of military importance. The issues include medical risks to HIV-infected and uninfected soldiers in the combat situation; and the impact, if any, of HIV infection on unit psychological integrity and cohesiveness that would otherwise impede mission performance.

Readiness related risks to HIV-infected personnel include adverse reactions to non-HIV related medical treatment and preventive vaccines, and unknown secondary effects of physical and mental stress. Readiness imposes certain HIV-related risks on uninfected personnel. These are primarily associated with deployment to areas of high HIV prevalence, although risks from contaminated blood increase during wartime if battlefield donors include HIV-infected U.S. or foreign soldiers. Therefore, the development of rapid blood screens as well as a vaccine and chemoprophylactic are critical research objectives. The Army must be sure of a supply of safe blood for both military and civilians injured during combat or deployments.

Unit cohesion and integrity may be affected by including HIV-infected personnel due to cultural prejudices and fear of casual or blood donor contact. No research findings exist to support this possibility, but anecdotal evidence and perceptions suggest it should be considered.

Similarly, no good evidence exists that the performance of early stage HIV-infected personnel degrades as a result of infection. However, little research has been undertaken to examine this issue.

RECOMMENDATIONS

R-32. Deployment Transmission Risks. The Army should undertake both epidemiological and clinical research to determine the risks, if any, faced by HIV-infected as well as uninfected individuals as a consequence of potential combat deployment. Risks associated with traumatic battlefield injuries, as well as preventive strategies, should be identified.

R-33. Immunizations Against Infectious Diseases. The Army must determine, through well-designed medical studies, if immunizations with both live and killed vaccines have a detrimental effect on the health of HIV-infected soldiers. It must be determined if immunological responses in HIV-infected individuals with early infection are satisfactory and predictable.

R-34. Susceptibility to Infections. The Army should continue research aggressively on the susceptibility of HIV-infected persons to domestic, opportunistic, and exotic infectious agents. But research must be directed at those infections that are associated with high morbidity or mortality and those diseases that historically have had a significant military impact on operations.

R-35. HIV Prophylaxis. The Army's medical research effort must continue to include HIV prophylaxis, in addition to vaccine testing and drug treatment. Prophylaxis may include both chemoprophylactic drugs and passive immunizations that could be administered in a pre-exposure or post-exposure mode, and could be used in emergency deployments to high prevalence areas.

R-36. Vaccine Testing. The Army, with its strong track record in vaccine research, should both develop and evaluate candidate HIV vaccines from Army and other laboratories that may have applicability in military populations. The current research effort with the gp160 immunotherapy vaccine should be continued.

R-37. Drug Treatment. The Army should continue its current program of evaluation of promising drugs that may slow or halt progression of early HIV infection. All HIV-infected personnel should be given an opportunity to participate in drug efficacy trials.

R-38. Testing and Safety of the Blood Supply. The Army should give high priority to the development and/or testing of a promising rapid screening test for HIV. The screening test must be field-expedient and technologically simple, with high sensitivity. The Army should continue in its overall efforts to provide safe blood and blood components in the field setting, to include options to extend the useful life of screened whole blood.

R-39. Neurobehavioral Research. Neurobehavioral research should include investigations of the performance of highly skilled and stressful tasks faced by soldiers, as well as other neurological and cognitive measures.

RESEARCH
TREATMENT AND PREVENTION
FINDINGS

F-21. Presidential Commission Report and Research. The report recognizes the unique role that the DoD plays in the national response to HIV and endorses continued research support (pp. 155-158 of the report). The threat of HIV to the national defense is also acknowledged. However, the amount of funding recommended in the report is far short of what is required for a good research and intervention program in the military, and is low, given the appropriate and comprehensive program proposed by the Army.

F-22. HIV Testing, Counseling, and Research. The Army is providing a unique and indispensable service to the military and the Nation through its HIV testing and epidemiological and clinical research. The Army is actively involved in the development of national policies on the testing and counseling of persons at increased risk.

F-23. Research Program. The comprehensive Army research effort on HIV prevention uniquely complements other international, governmental, academic, and industrial programs. As the lead agent for research, the Army has made considerable progress in involving the Navy and Air Force in the research program, and has addressed militarily unique aspects of HIV infection. The priorities and objectives of the military research effort is to: (1) test and evaluate vaccine and prophylactic drugs; (2) identify risk factors important in troop education and prevention of transmission; (3) develop an efficient and highly reliable field laboratory field test; (4) test and evaluate drugs for early intervention (e.g., Walter Reed stages 1 and 2); and (5) evaluate the course of HIV infection in military populations.

DISCUSSION

The goals of the Army research-linked preventive effort are:

- (a) to reduce the incidence of HIV infection among its military personnel and other beneficiaries; and
- (b) to arrest progression of infection among persons in the early stages of infection.

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The unique military environment is an ideal setting to conduct research on the natural history, clinical course, and prevention of HIV infection. Included are periodic testing of the force, an integrated medical care system, and a retirement system that allows follow-up of infected individuals within the military health care system.

RECOMMENDATIONS

R-40. Surveys. Periodic surveys on HIV-related behavior, effects of education, and prevailing attitudes must be performed to provide information on how HIV education can best be accomplished. These surveys must be conducted as a research program, for they examine complex issues on changes of knowledge, attitudes, beliefs, and behavior. The following questions must be addressed:

a. What are the misunderstandings that individuals have about HIV infection, how infection is transmitted, and how transmission can be prevented?

b. How can high risk behavior be modified?

c. What are the general and local needs for health education on HIV and AIDS?

d. What educational efforts have been the most and least successful in reducing the incidence of HIV infection?

R-41. Prevention Among Soldiers. The Army should continue to work aggressively at controlling the spread of HIV within the active Army, Army Reserves, and the Army National Guard.

R-42. Research into Prevention. Well-designed epidemiological and clinical research studies targeted on reducing the incidence of HIV infection in military and military-associated populations should be conducted to "conserve the fighting strength."

R-43. Research and Behavior Modification. The Army HIV educational effort for behavior modification must receive financial backing and personnel resources. This is one specific area where the Army could potentially make significant contributions in determining how behavior modification with secondary reduction in disease transmission can be best achieved.

R-44. Programming and Budgeting. The research program must be adequately funded and staffed. Since the Army is the Lead Agency within DOD for this research, research resources allocated to the Army must continue to support Navy, Marine, and Air Force research programs. Resource demands are also greater because the disease treatment process includes a large psychosocial support component. Resource requirement estimates developed for the Subgroup indicate the funding must be increased from the current level of \$22 million per year. Assured funding of \$45 million in constant 1991 dollars must be maintained for a long enough period to meet the minimum goals. The estimates must be periodically readjusted based on new research findings and future medical cost increases. Dual year funding should not be used.

APPENDIX A

Tasking Memorandum from the
Assistant Secretary of the Army
(Research, Development and Acquisition)

5 May 1988



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, DC 20310-0103



05 MAY 1988

Mr. Gilbert F. Decker
Chair, Army Science Board
Penn Central Federal Systems Company
1800 Diagonal Road
Suite 500
Alexandria, VA 22314-2840

Dear Mr. Decker:

You are requested to appoint a panel of five to nine Army Science Board members to study the threat of AIDS on operational deployments of Army forces to a theater. The study should address as a minimum the Terms of Reference (TOR) described below; however, the panel should consider the TOR as guidelines and not be inhibited from considering other issues regarding AIDS and operational deployments of soldiers that they may deem important.

I. Background.

The national epidemic of infections of the Human Immunodeficiency Virus (HIV), the viral agent that causes the Acquired Immunodeficiency Syndrome (AIDS), is of sufficient proportions as to require an evaluation of its near, mid, and long term threats to the Army's ability to perform its assigned missions.

The AIDS virus, or HIV, entered the United States in the 1970's probably along several geographical vectors of human carriers all of which appear to have their origins in central Africa. The extrapolation of U.S. Army data and Center for Disease Control (CDC) reports indicates that HIV had probably infected about two million Americans by 1987. No definitive epidemiological studies exist because of the absence of a statistically significant national testing program. The spread of HIV infections has progressed to over 50,000 cases of AIDS.

Until 1987, the annual reporting of the CDC indicated an annual doubling of the number of diagnosed AIDS cases, implying that there had been an annual doubling in infections sometime in the past. The decrease in reported AIDS cases starting in 1987 may reflect either the earlier saturation of infection in high risk groups or a significant withholding of information of diagnosed AIDS cases by physicians wishing to protect their patients from any social stigma.

The Army has been testing applicants for military service for DoD since October 1985 and has found that the overall prevalence of HIV infection in this sample of Americans has remained roughly constant at about 1.6 per 1000. The ratio of male to female infections has been about 2.7 to 1 (in contrast to a much higher proportion of reported AIDS cases in males than females due to the high representation of male homosexuals).

The HIV/AIDS epidemic is apparently far more serious in several other parts of the world than even in the U.S. Most of these areas could conceivably be considered for the deployment of U.S. military forces under a variety of future foreign policy scenarios. The worst hit nations appear to be in central Africa (where HIV apparently first jumped the species barrier between monkey and man) and its radiating trade routes, Haiti (an early and repeated recipient of infection from Africa), and Cuba (the Angolan connection). Infection prevalence may be as high as 30 percent or more in urban areas of these regions and countries and is probably near 100 percent among active prostitutes. The ratio of infected males to females in Africa is essentially 1 to 1, indicating that transmission is largely through heterosexual contact (other sexually transmitted diseases appear to be a major cofactor). Blood supplies are not generally screened for HIV and are universally infected.

Nationally, the general threat in the HIV/AIDS epidemic faced by the military services is the same as that faced by the society as a whole. If the epidemic is not controlled or does not encounter some self limiting process, the most productive members of the society, including those needed for military service, will be increasingly unavailable for critical activities while the cost of health care takes an ever larger proportion of our national resources.

Internationally, it will be increasingly difficult for U.S. Military deployments to be made routinely into or near regions of the Third World where there is a much more advanced stage of the epidemic among heterosexuals. Extensive precautions must be made against the exposure of Service personnel and their dependents to HIV infection in spite of potential detriment of morale and performance. Political difficulties are likely in host countries due to these precautions.

II. Terms of Reference

1. Could the manpower pool for the Army be seriously depleted by a critical prevalence of HIV infection in the population? What is the likelihood that this could occur?

2. Can the Army benefit from the study on AIDS by the National Commission? (If so, how?)
3. What specific parts of the world present a known threat due to the prevalence of AIDS in that area?
4. When deployment into a third world area and/or into a known AIDS threat area is planned, what issues involving blood supplies need to be considered?
5. What are the high leverage AIDS preventive measures that the Army can take?
6. Should personnel with HIV be eliminated from deployment into combat?

The study is expected to be classified, so appropriate consideration should be given to security clearances in selecting panel members and the study chair.

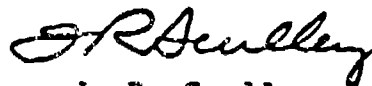
The study is expected to require briefings by resource personnel as well as possible visits to some field locations.

LTG Schwarzkopf, the Deputy Chief of Staff for Operations and Plans, and LTG Becker, the Army Surgeon General, will co-sponsor the study. The cognizant deputy will be BG Richard D. Beltson. The senior advisors will be MG Philip K. Russell, Commanding General Medical Research and Development Command, BG John O. Sewall, Director of Strategic Plans and Policy, ODCSOPS. The primary DA Staff Assistant will be COL William L. Moore, Office of the Surgeon General. Assisting him will be LTC Russell C. Hunt, Office of the Deputy Chief of Staff for Operations and Plans.

It is not expected that your inquiry will go into any "particular matters" within the meaning of Section 208, Title 18, of the United States Code.

Please complete this study and report by 31 October 1988.

Sincerely,



J. R. Sculley
Assistant Secretary of the Army
(Research Development and Acquisition)

Enclosure

APPENDIX B

Ad Hoc Subgroup Membership

and

Support Staff

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APPENDIX C

Witnesses before the Subgroup

Ad Hoc Subgroup on Threat of AIDS
on Operational Deployment of Army Forces to a Theater
Army Science Board

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APPENDIX D

United States Army

Medical Research and Development Command

Retrovirus Research Program

(EXTRACT)

RESEARCH GOALS

The US Army Medical Research and Development Command Retrovirus Research Program strives to achieve the following goals among military-associated populations:

1. Reduce the incidence of new HIV infections to zero.
2. Reduce the rate of appearance of symptoms (progression) among asymptomatic HIV-infected patients to zero.
3. Reduce the HIV-attributable death rate to zero.

The Army HIV Research Program is focused on those aspects of the HIV epidemic that present a direct threat to US military readiness.

Hence:

1. since the US Army has a strong track record in vaccine research, development, and testing, this proven expertise in vaccinology is being applied to development and evaluation of candidate HIV vaccines.
2. Since interruption of the spread of this disease can be effected by an appropriate change of behavior, an extensive effort to improve education that results in a change in behavior has been instituted. This requires extensive basic investigation as to why certain behaviors are indulged in.
3. Epidemiologic and clinical studies conducted by military investigators are targeted on military and military - associated populations. Emphasis is placed on the design and implementation of strategies "to conserve the fighting strength", i.e., reducing the prevalence and incidence of HIV infections among active duty personnel, and arresting progression of disease among personnel who are currently infected but asymptomatic.
4. As a result of its screening programs, the US military is at present the only large population in the world in which the true prevalence and incidence of HIV are known. Epidemiologic studies to assess the efficacy of various prevention efforts (general education, test-linked counselling, vaccines, chemoprophylaxis) can be readily accomplished, with accurate measurements of their impact on the incidence of HIV.
5. The stage of disease of all HIV-infected US military personnel is routinely determined every six or twelve

months according to the Walter Reed Staging System. At present, most infected service personnel are in the early stages of disease (Walter Reed Stages 1 and 2). Thus, a principal focus of the military HIV research effort is on prevention of progression of patients with early disease. The efficacy of various therapies (immunotherapy or chemotherapy) for early stage disease can be readily evaluated through continued routine monitoring of the stage of illness in treated and control populations.

6. A substantial proportion (approximately 30%) of HIV-infected servicemen and women are married. The spouses of these personnel are at significant risk of HIV infection through heterosexual transmission; at present approximately 20% are already infected. The population of HIV-infected personnel and their spouses is carefully being studied to determine the factors associated with heterosexual transmission, and the efficacy of interventions to prevent transmission.
7. The US military operates a worldwide network of medical research laboratories. One of the principal missions of these laboratories is collection of information on diseases that could influence US military operations overseas. HIV surveillance by overseas US military laboratories is ongoing.

USAMRDC HIV Research Program Accomplishments (Apr 90)

1. Established world's best quality assurance testing program: error rate (false positive) 1/135,000 to 1/1,000,000.
2. First group to focus on diagnosis of early infection, now a national priority.
3. Established worldwide standard for classifying clinical stages of HIV infection (Walter Reed Staging Classification).
4. First group to identify heterosexual transmission in US population.
5. Provided scientific data base for and defended DOD policy on HIV; i.e., entry screening, earlier separation, troop education, and no OCONUS assignment.
6. Improved patient management through application of critical clinical information obtained from natural history studies.
7. Provided the principle source of infected early stage

cases for US public health policy.

8. Vaccine Program. Because no known protective immunity exists and because of the difficulties in testing a potential vaccine in the field, a unique strategy has been followed. The concept is that a specific HIV vaccine can be given that will augment or induce a protective immune response in infected persons (immunotherapy) as evidenced by an alteration of the natural course of infection, improved survivability and/or potential eradication of the virus without associated toxicity.

As of 30 April 1990:

- a. 30 patients have been immunized with a modified protein of GP160, the envelop region of the virus.
 - b. Of the eight patients that have completed the trial > 250 days; five have responded with a vigorous immune response to regions of the HIV envelop or hidden epitopes felt to be important in viral neutralization and associated with improved survival.
 - c. In addition, the vaccine responsive volunteer's CD4 cells (known to be infected and destroyed by the HIV and the decline is a marker of disease progression) stabilized and actually increased compared to the vaccine nonresponsive volunteers.
 - d. No toxicity has been observed.
9. Selected epitopes have protected monkey's against SIV.
 10. No difference in performance of WR1 and 2 have been noted with regards to promotion, demotion or disciplinary action taken.
 11. A general decrease in incidence in the Army has taken place. However, infection rates among black soldiers has not decreased.

U.S. ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND

RETROVIRUS RESEARCH PROGRAM

FIVE YEAR PLAN: FY 89 - FY 93

REPORT OF A CONFERENCE OF WALTER REED ARMY MEDICAL CENTER
PHYSICIANS AND SCIENTISTS

2 - 4 NOVEMBER 1988, HAGERSTOWN, MARYLAND

This report is not an official publication of the US Army Medical Research and Development Command. The positions and opinions presented herein do not necessarily reflect those of the US Army, the US Department of Defense, nor the US Government. This report was collated and edited by COL Donald S. Burke, Director, Division of Retrovirology, Walter Reed Army Institute of Research, Washington, D.C., 20307-5100, Telephone (301) 295-6414/6415.

SUMMARY

On 2-4 November 1988, seventy physicians and scientists from the Walter Reed Army Medical Center and the Walter Reed Army Institute of Research met in Hagerstown, Maryland to produce a five-year planning document for the US Army Medical Research and Development Command Retrovirus Research Program. Collaborating medical scientists from the other Uniformed Services also participated. Agenda items included (1) five-year goals for the control of HIV in the military (2) the role of the military program in the national effort (3) guidelines for prioritization of research projects, and (4) specific research objectives in each of the general categories of diagnostics, natural history, epidemiology and preventive medicine, chemotherapy, viral immunology, animal models, and international health.

Ambitious goals were set for control of HIV in military populations by 1993: reduction of the incidence of new HIV infections to zero, reduction of the rate of progression from asymptomatic to symptomatic disease to zero, and reduction of the HIV attributable death rate to zero.

The military retrovirus research program was seen as complementary to those of other federal health agencies in the national effort. The military program is unique in that early diagnosis of HIV is considered a routine procedure in the practice of military medicine. At present the US military is the only large population in the world in which the true prevalence and incidence of HIV are known, and in which the stage of all HIV-infected patients is known. This rational focus on early diagnosis provides opportunities for studies of treatment and prevention that are extremely difficult in the civilian population.

Guidelines were established for allocation of research resources. Studies designed to evaluate interventions were accorded higher priority than studies designed to generate descriptive data, and research aimed at prevention of infection was accorded higher priority than research aimed at treatment of disease in persons who are already infected. A hierarchy of priorities was defined by category of study, from highest to lowest priority: viral immunology, epidemiology, chemotherapy, natural history, diagnostics. Some high priority research can best be accomplished by studies overseas while others will require use of primate model systems.

Nineteen explicit major research objectives were established for the military retrovirus research program for the next five years.

BACKGROUND

The U.S. Army Medical Research and Development Command (USAMRDC) first became formally involved in work on retroviruses in June 1985, when the Walter Reed Army Institute of Research was tasked by the Army Surgeon General to provide quality assurance for Human Immunodeficiency Virus (HIV) testing of blood donated at Army blood banks. HIV testing programs rapidly expanded to include civilian applicants for military service, active duty soldiers, National Guard, and Reserves. USAMRDC involvement in these operational programs increased correspondingly. During the past 3½ years, over 4 million persons have been evaluated through Army HIV testing programs. Epidemiologic data generated in military HIV screening programs have been carefully collected and analyzed by Army research workers. These analyses have provided valuable insights into the magnitude and dynamics of the epidemic.

The USAMRDC received its first tasking for retrovirology research work (as opposed to operational support work) in August 1986. At that time, Congress instructed that the military should initiate research in the areas of diagnostics, natural history, epidemiology, chemotherapy/chemoprophylaxis, and immunotherapy and vaccine development. It was understood that the research effort was to be coordinated closely with on-going testing and staging programs.

Substantial progress has been made. The intramural program has made an impressive start: over 60 papers on HIV, authored by Walter Reed physicians and scientists, have been published in the medical and scientific literature. The extramural component of the program is also off to an excellent start: a select, highly productive group of 54 university and industry-based research teams have been awarded USAMRDC contracts for retrovirus research.

The administrative structure for a major research program has been built "from scratch." Four key steps have been completed in the past year: (1) an HIV clinical research unit has been established at Walter Reed Army Medical Center; (2) a new fully equipped Retrovirology research laboratory has been opened in Rockville, MD by the Walter Reed Army Institute of Research; (3) a unique Memorandum of Understanding has been signed by the US Army Health Services Command (HSC) and the US Army Medical Research and Development Command committing both commands to sustained cooperation on HIV research; and (4) the Henry M. Jackson Foundation for the Advancement of Military Medicine has been awarded a substantial grant from the USAMRDC to cooperate with the HSC and the USAMRDC on HIV research. A solid structure for an applied research program is now in place.

The start of FY 89 was considered to be an appropriate time to crystalize long-term goals and to develop long-term research strategies to minimize the impact of HIV on military readiness. To this end, seventy medical scientists from Walter Reed and collaborating institutions met in Hagerstown, Maryland on 2-4 November 1988, and produced the following planning document.

STATEMENT OF THE PROBLEM

HIV Infections in US civilian populations:

The epidemic of HIV in the United States began in the mid-1970's. Infections spread silently until 1981, when clusters of cases of young men with acquired immunodeficiency were first recognized. These clinically apparent cases were the first "tip of the iceberg" recognized, but the true extent of spread of HIV remained unknown. The discovery of the Human Immunodeficiency Virus in 1984 led to the prompt development and use of blood tests in 1985. Only after wide scale screening with HIV blood tests was the full scale of the epidemic appreciated: 1-1½ million Americans, mostly young adult males, are infected. Nationwide, one in every 600 applicants for US military service is infected with HIV. In some US urban centers, one in 50 is infected.

Known HIV infections in the US military:

Over 5000 HIV-infected persons currently receive their medical care at US military hospitals, most of whom were detected through routine military screening programs. Approximately two-thirds of these persons are presently asymptomatic with relatively intact immune systems (Walter Reed Stages 1 and 2), while one-third already show evidence of immune deficiency (Walter Reed Stages 3 to 6). Without dramatic improvements in the treatment of HIV, it is likely that most, and perhaps all, of the 5000 HIV-infected persons in the military health-care system will die from the disease in the next decade.

Projected HIV infections in the US military:

Repeat screening of active duty personnel has generated data from which the incidence of new HIV infections can be calculated. Preliminary but solid evidence indicates that approximately 1 out of every 1500 active duty personnel are becoming newly infected with HIV each year. If these data are extrapolated to the entire active military forces, between 1000-1500 military personnel are becoming infected each year with this fatal, communicable disease. At this rate, the total burden imposed by HIV on the military health care system will double within four years: by 1993, 10,000 soldiers, sailors, and airmen will be progressing slowly and inexorably toward death from acquired immune deficiency.

HIV as an international threat to military operations:

Concerns have been expressed by some friendly governments that US military might export HIV to their countries. These concerns were obviated by the prompt implementation of US military screening programs and restriction of HIV-infected US personnel from overseas assignments. US military personnel are currently the one group of international travellers who are least likely to carry and transmit HIV.

HIV and acquired immune deficiency pose a significant problem to U.S. personnel in sub-Saharan Africa. Infection rates of 10-20% have been documented among apparently healthy young adults, both males and females, in several major cities. The epidemic may influence military and political stability in the region.

In Europe and the Americas, countries allied to the United States are experiencing epidemics of acquired immune deficiency. HIV infection rates among allied military forces have not been measured.

HIV in military dependent populations:

Approximately 30% of HIV-infected soldiers are married. The spouses, infants, and unborn children of these HIV-infected military personnel are at significant risk of infection. Data on HIV infection rates among military dependent populations are currently being collected and analyzed.

FIVE-YEAR GOALS

The US Army Medical Research and Development Command Retrovirus Research Program strives to achieve the following goals among military-associated populations by the end of 1993:

1. Reduce the incidence of new HIV infections to zero.
2. Reduce the rate of appearance of symptoms among asymptomatic HIV-infected patients to zero.
3. Reduce the HIV-attributable death rate to zero.

These simply stated goals are ambitious, perhaps overly so. Although complete elimination of new infections, symptoms, and death from HIV within five years represents the ideal, these goals can alternatively be expressed in more modest increments:

1. Reduce the incidence of new HIV infections by 20% per year.
2. Each year, lengthen the projected median disease-free interval among asymptomatic patients by six months.
3. Each year, lengthen the projected median survival among symptomatic patients by six months.

Military medical research may succeed in providing the tools to accomplish these goals, but mere availability of the tools does not insure full attainment of the goals. Research advances in therapeutics and preventive medicine must be rapidly implemented in the operational health care arena. The military track record to date has been excellent in this regard: technologic advances in diagnosis, staging, and treatment of HIV have been rapidly introduced into "standard of care" medicine in the military. There is good reason to believe that the military leadership will continue to exercise wisdom in its vigorous efforts to combat HIV.

ROLE OF THE MILITARY RETROVIRUS RESEARCH PROGRAM
IN THE NATIONAL EFFORT

The HIV epidemic is a serious problem for all elements of American society. The Department of Health and Human Services (DHHS), and in particular the U.S. Public Health Service, has appropriately been tasked as the lead Federal organization for HIV research and control efforts: the DHHS HIV research budget for FY 89 totals approximately \$700 million. By comparison, the Department of Defense (DoD) appropriation for HIV research for FY 89 is \$27 million.

How should the military HIV research effort be targeted? What unique features of the military approach to HIV can be used to complement other federally sponsored efforts? What is the appropriate relationship between the DoD and other federally sponsored programs?

Clearly, the DoD HIV research program must focus on those aspects of the HIV epidemic that present a direct threat to US military readiness. The research program should be applied, rather than basic, in its orientation. Through close cooperation with research workers in the DHHS, industry, and academia, advances in the basic sciences should be translated into intervention strategies and promptly applied to reducing the impact of HIV on the US military:

(1) Epidemiologic and clinical studies conducted by military investigators should be targeted on military and military-associated populations. Emphasis must be placed on the design and implementation of strategies "to conserve the fighting strength", i.e., reducing the prevalence and incidence of HIV infections among active duty personnel, and arresting progression of disease among personnel who are currently infected but asymptomatic.

(2) As a result of its aggressive screening programs, at present the US military is the only large population in the world in which the true prevalence and incidence of HIV are known. Epidemiologic studies to assess the efficacy of various prevention efforts (general education, test-linked counselling, vaccines, chemoprophylaxis) can be readily accomplished, with accurate measurements of their impact on the incidence of HIV.

(3) The stage of disease of all HIV-infected US military personnel is routinely determined every six or twelve months according to the Walter Reed Staging system. At present, most infected service personnel are in the early stages of disease (Walter Reed stages 1 and 2). Given this

large population of well-characterized early stage patients, a principal focus of the military HIV research effort should be on prevention of progression of patients with early disease, rather than on treatment of opportunistic infections and prevention of death among patients with late stage disease ("AIDS"). The efficacy of various therapies (immunotherapy or chemotherapy) for early stage disease can be readily evaluated through continued routine monitoring of the stage of illness in treated and control populations.

(4) A substantial proportion (approximately 30%) of HIV-infected servicemen and women are married. The spouses of these personnel are at significant risk of HIV infection through heterosexual transmission; at present approximately 20% are already infected. The population of HIV-infected personnel and their spouses should be carefully studied to determine the factors associated with heterosexual transmission, and the efficacy of interventions to prevent transmission.

(5) The US military operates a worldwide network of medical research laboratories. One of the principal missions of these laboratories is collection of information on diseases that could influence US military operations overseas. HIV surveillance by overseas US military laboratories should be intensified.

(6) The US military has a strong track record in vaccine research, development, and testing. This proven expertise in vaccinology should be applied to development and evaluation of candidate HIV vaccines. It is likely that an effective vaccine would be promptly applied in military populations.

The US military is uniquely positioned to play an important role in the national effort to combat HIV in the areas of diagnosis, natural history, epidemiology, chemotherapy/chemoprophylaxis, and immunotherapy/immunoprophylaxis (vaccines). Optimal effectiveness of the military program will require continued close cooperation with other federal health agencies (National Institutes of Health, Centers for Disease Control, Food and Drug Administration). Military populations and military health care agencies can be effectively mobilized as a national resource to provide an unparalleled system for tracking of the epidemic, and to test new developments in prevention and therapy. In solving its own unique problems with HIV, the military may serve as a "demonstration project" for the nation at large.

GUIDELINES FOR ESTABLISHING PRIORITIES

The following brief discussion presents guidelines for prioritization of HIV research projects within the military. This discussion is not an exhaustive review nor an immutable set of rules; it is merely intended to reflect a rationale for allocation of US military HIV research resources.

Descriptive versus Interventional Studies:

The retrovirus research program in the military is already well underway. As a consequence of three years of experience with aggressive screening programs, military research workers have generated unparalleled information concerning the prevalence, incidence, and transmission of HIV among military and military-associated populations, and have begun to describe the natural history (rate of progression) of untreated disease. These data have been critical to defining the dimensions of the problem.

Now that the problem is reasonably well defined, it is time to shift the direction of the military research program from its past "descriptive" orientation to one that has a clear emphasis on intervention. Research projects should be prioritized accordingly: interventional > descriptive.

Prevention of infection versus treatment of disease:

As stated above in the program "Goals", future efforts should focus on devising and evaluating strategies to (a) prevent new infections, (b) prevent progression of disease in persons who are HIV-infected but asymptomatic, and (c) prevent death in persons with symptomatic disease. Considerable effort is currently being expended by civilian health agencies to devise treatments for patients with late stage disease. This goal is no less important for military health care providers, but the unique military mission to "conserve the fighting strength" demands that the military research program must emphasize prevention of new infections and prevention of progression to incapacitating disease. Military HIV research projects should be prioritized accordingly: prevention of infection > prevention of progression > prevention of death.

Category of research effort:

Most of the clinical treatment trials sponsored through the National Institutes of Health are designed to evaluate chemotherapeutic agents (anti-viral drugs) for treatment of late stage patients. Indeed, in view of the enormous investment being made by private industry and the NIH in HIV drug discovery and drug treatment evaluation programs, it is unnecessary for the

military to make a significant investment in these areas. In addition, while chemoprophylaxis may be a feasible strategy for short-time protection against HIV, problems with long-term drug toxicities and problems with drug compliance render immunoprophylaxis and immunotherapy as attractive alternatives to chemoprophylaxis and chemotherapy. For these reasons, it seems clear that the military research effort should emphasize strategies to modify the host immune status to HIV (immunotherapy) during the early stages of disease. Information gathered during immunotherapy trials will also be useful in vaccine design and testing: it is probable that host immune factors which hold virus replication in check during the early stages of disease will also be critical targets for stimulation by vaccines.

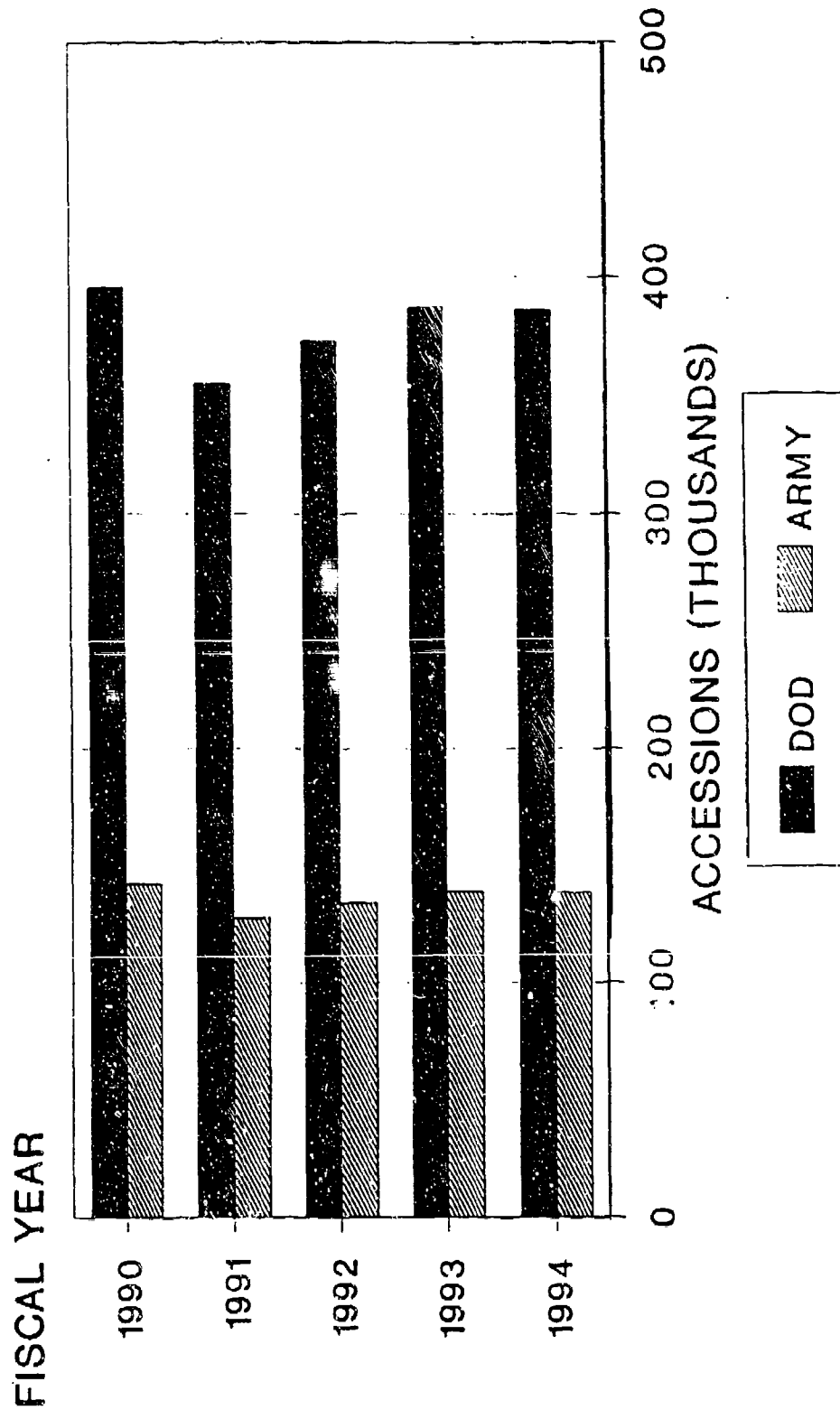
Given the resources available to the military, and in view of the points outlined above, the following ranking of priorities for various types of studies should be applied: viral immunology > epidemiology > chemotherapy > natural history > diagnostics.

APPENDIX E

Projected Effects of Various Levels of
Seroprevalence of HIV Infection
in the Recruit Population on Manpower
Requirements During Mobilization
and Estimated Research Funding

ACCESSION REQUIREMENTS

ARMY VS DOD

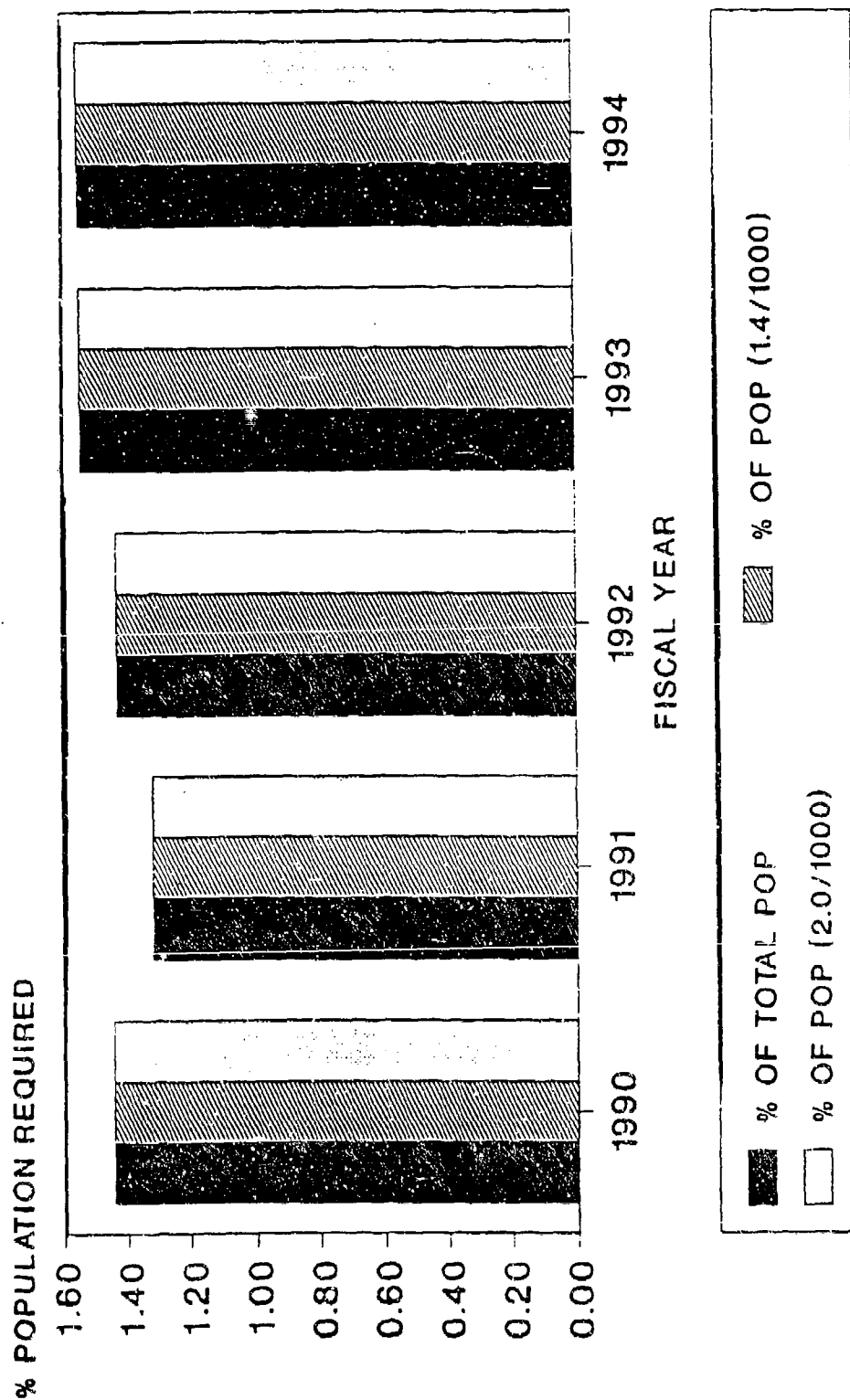


SOURCE: ODCSPER

APPENDIX E-1
DECEMBER 1988

ENLISTED ACCESSIONS

PERCENT OF RECRUIT POPULATION

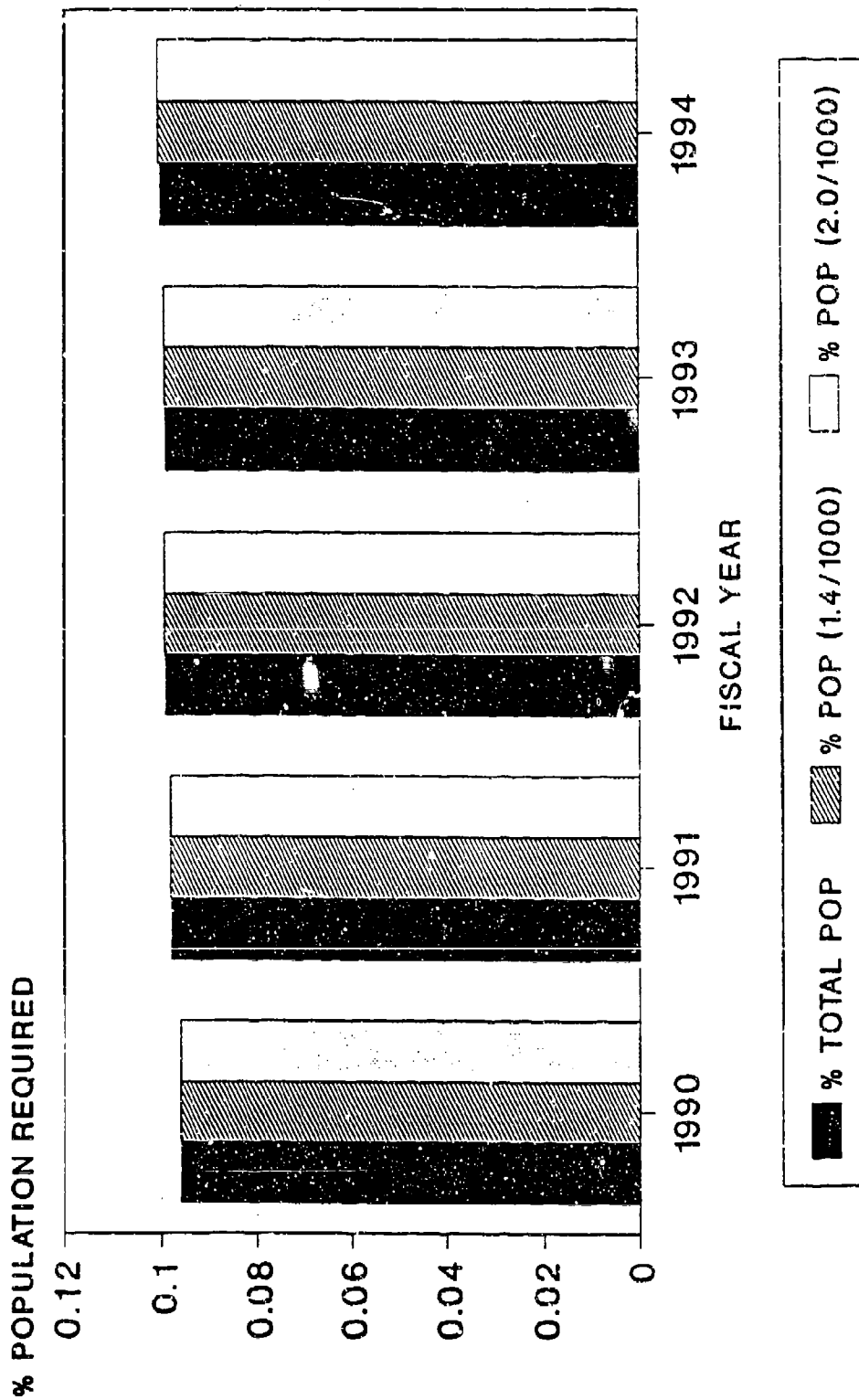


SOURCE: ODCSPER

APPENDIX E-2
DECEMBER 1988

OFFICER ACCESSIONS

PERCENT OF RECRUIT POPULATION

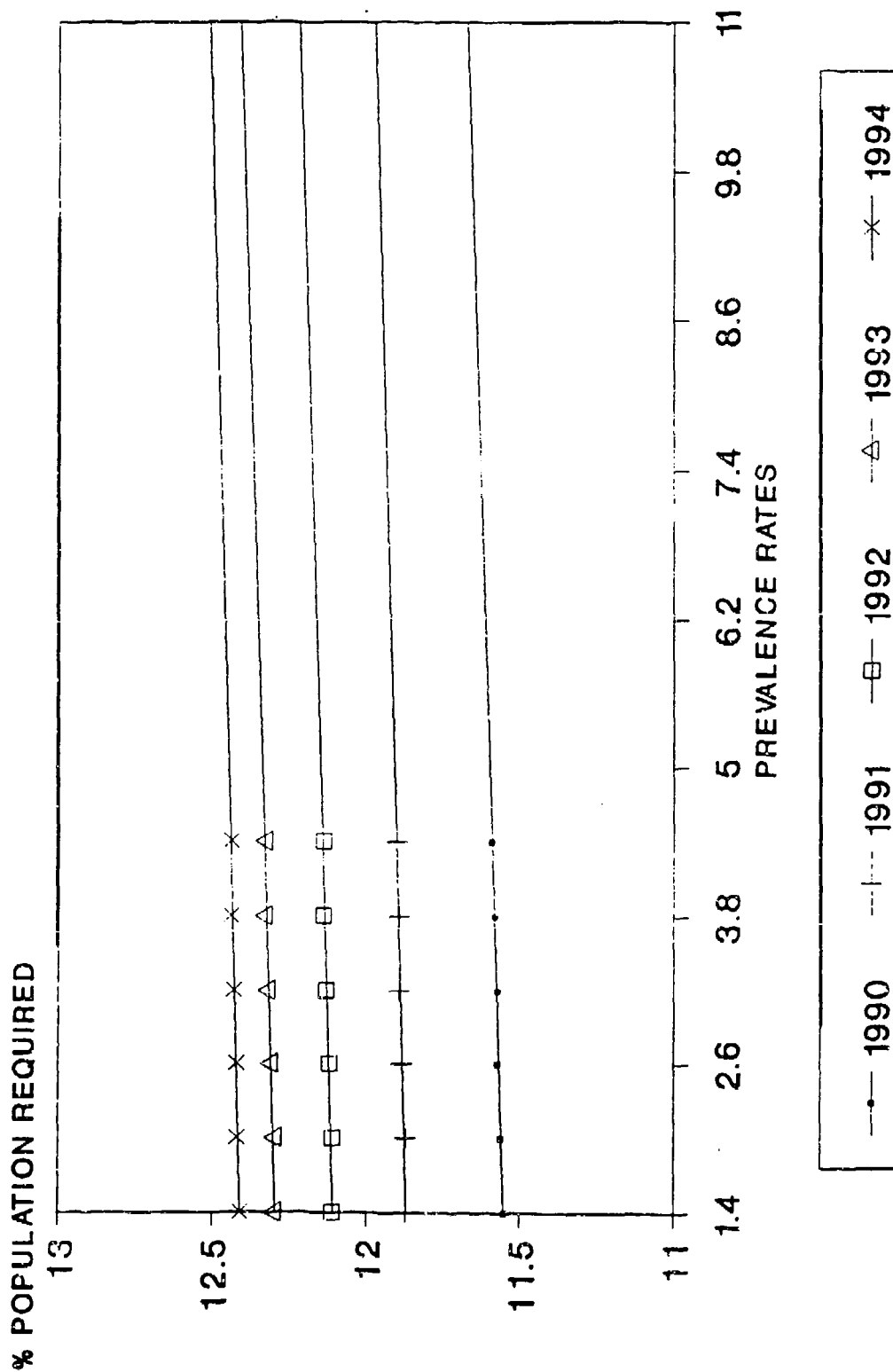


SOURCE: ODCSPER

APPENDIX E-3
DECEMBER 1988

PREVALENCE VS REQUIREMENTS

IS THE RECRUIT POPULATION SUFFICIENT?



SOURCE: ODCSPER

APPENDIX E-4
DECEMBER 1988

APPENDIX F

Estimated Lifetime Per-Case Healthcare Costs
for Each Case of HIV Infection in a Soldier

HEALTH CARE COST ESTIMATES

LIFETIME, PER CASE

COST ELEMENT	LOW ESTIMATE PER CASE	HIGH ESTIMATE PER CASE
INPATIENT CARE	\$ 80,000	\$ 80,000
MEDICATION	\$ 43,000	\$ 93,000
PERSONNEL COSTS		
CIVILIAN	\$ 7,000	\$ 7,500
MILITARY	\$ 7,500	\$ 8,000
TOTALS	\$137,500	\$188,500

Inpatient care cost is median of three different sources.

Medication costs are based on actual use.

Personnel costs based on time spent per case by category.

APPENDIX G

Estimated Per-Case Personnel Costs
of HIV Infection in Active Duty Soldiers

ESTIMATED PERSONNEL REPLACEMENT COSTS

(RESULTING FROM HIV INFECTION) (\$ PER CASE)

CATEGORY	COST PER CASE
<u>TRAINING</u>	<u>\$ 14,618</u>
LOST MANYEARS	\$ 5,272
<u>TOTAL</u>	<u>\$ 19,890</u>

TRAINING COSTS CALCULATED ON ACTUAL EXPENDITURES TO
TRAIN SOLDIER POPULATION IDENTICAL TO PRESENT PORTION
OF FORCE WHICH IS HIV-INFECTED.

LOST MANYEAR COSTS BASED ON PROFILE OF PORTION OF
FORCE WHICH IS HIV INFECTED.

APPENDIX H

GLOSSARY

Glossary

AIDS	Acquired Immune Deficiency Syndrome
ASBPO	Armed Services Blood Program Office
CONUS	Continental United States
DHHS	Department of Health and Human Resources
DOD	Department of Defense
GAO	United States General Accounting Office
HIV	Human Immunodeficiency Virus
MOS	Military Occupational Specialty
NIH	National Institutes of Health
OCONUS	Outside Continental United States
ODCSPER	Office, Deputy Chief of Staff for Personnel
TDRL	Temporary Disability Retired List
TOR	Terms of Reference
USAMRDC	U.S. Army Medical Research and Development Command
WRAIR	Walter Reed Army Institute of Research

APPENDIX I

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